SOVIET GROUND FORCE ITEMS

FIELD ROCKETS

Summary of Inputs)

	per aggregate rocket of 148 lbs	Per lb. of Rocket	per 1000 lbs of rocket
Ingot Steel	147 lbs	.993 lbs	993 lbs
Ingot Aluminum	1.5 lbs	.010135 lbs	10.14 lbs
Pig Copper	1.0 lb	.00675 lbs	6.75 lbs
Pig Zinc	.5 lb	.003878 lbs	3.88 ~~8.88~~ lbs
Man Power	8 man-hours	.108 ~~.05~~ man-hrs	108 ~~5.41~~ man-hrs
Electric Power	60 kwh	.41 kwh	410 kwh

Methodology: (Materials)

The 82mm rocket is considered obsolete so use 132mm and 300mm rockets

	132mm		300mm
Shell	35.2 lbs		53.9 lbs
Body and Tail	31.1 lbs		66.4 lbs
Total Weight, Steel	66.3 lbs		120.3 lbs
Average weight, Steel		93.7 lbs	
Fuse weight	1.0 lbs		2.1 lbs
Average weight		1.5 lbs	
Total weight, Rocket	93.7 lbs		202 lbs
Average weight, Rocket		148 lbs	

Above weights taken from British publication. Assume all aluminum and brass (copper & zinc) are in fuse. Assume further that half of fuse is aluminum and half brass (by weight) and that brass is 2/3 copper and 1/3 zinc.

Then aggregate fuse is:

3/4 lb. aluminum
1/2 lb. copper
1/4 lb. zinc

1-1/2 lb. fuse

Assume loss of steel from ingot to rocket parts is 40% and loss of aluminum and brass from ingot and pig to machined parts in fuse is 50%, then

$\frac{93.7}{.60}$ lbs steel = 147 lbs ingot steel

$\frac{.75}{.5}$ lbs aluminum = 1.5 lbs ingot aluminum

$\frac{.5}{.5}$ lbs copper = 1.0 lbs pig copper

$\frac{.25}{5}$ lbs zinc = .5 lbs pig zinc

Methodology (Labor):

U. S. practice has shown that one million rounds of small arms ammunition takes 10 man-years or 20,000 man-hours (50 weeks @ 40 hrs.) of U. S. labor. It is believed this figure includes direct and indirect labor. This figure has been applied to larger caliber ammunition by saying that 1,000 rounds of larger caliber ammunition (75 to 120mm) takes about 8,000 man-hours of labor. Assume that 1,000 rounds of the aggregate rocket takes about the same amount of labor.

A brief study of a half-dozen industries, none in weapons production unfortunately, has indicated that a Russian worker is only about 1/3 to 2/3 as productive as a U. S. worker. Based on this, the aggregate rocket takes 16,000 man-hours per 1,000 rounds.

Methodology (Electric Power):

U. S. practice shows that 60 kwh are required for a 160mm mortar shell. Assume that a Soviet aggregate rocket takes about the same.